SUPPLEMENT.

The Mining Journal,

RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

THE EXCURSIONS OF THE IRON AND STEEL INSTITUTE.

After the reading of the valuable papers—of which abstracts were given in this Journal—at the Mechanics' Institute, Dudley, on Aug. 29, the members of the Iron and Steel Institute took a special train at Dudley Station, and were conveyed to Gospel Oak. Here, in the school-room, a sumptuous repast in the shape of a cold collation had been provided by the ironmasters of the Tipton district. After the company had done justice to the good things put before them, Mr. Walter Williams, who was in the chair, in the name of the ironmasters of the district, welcomed the members of the Institute to South Staffordshire. He observed that they would see in the neighbourhood furnaces that had been at work 60 years, and they would see what old conservative firms could do, and perhaps come to the conclusion that conservatism could maintain itself in iron-making if in nothing else. He was also sorry to say that some works they would see were built and carried on more for the love of iron-making than for profit. Anything there was in the district of real interest they were determined the members of the Institute should see, and he hoped as long as South Staffordshire was an iron-making centre the members of the Iron and Steel Institute would look back with satisfaction to the visit. Mr. I. Lowthian Bell responded on behalf of the members of the Institute, and thanked Mr. Williams for the kind manner in which he had spoken. He said there was no need to make any apology for the old district, as her course had evidently been one of progress. In politics he had been termed a dangerous Radical, but he was far from that in the matter of iron-making. He thought that Cleveland might be proud of what it had done, but it did not follow that all the principles of iron-making in vogue in that district were applicable to the circumstance of South Staffordshire. Mr. Bessemer and others spoke, and then the party commenced their inspection of the works.

The Gospel Oak Ironworks were first visited, and here was seen the manufacture of wire and sheets, carried on to perfection. Bars 3 ft. long were thrown from the re-heating furnaces, and in a remarkably short space of time, drawn out into wires over 100 feet in length. A visit was next paid to the Wednesbury Oak Works, belonging to Messrs. Williams and Sons, where the manufacture of a first-class quality of iron is carried on. The works are well arranged, having plenty of space for the movements of the men, so that they are not huddled up near the machinery. After the foregoing works, and a few others of less importance, had been visited, a large portion of the members and friends proceeded by train to the establishment of Messrs. Thorneycroft and Co. This firm is one of the oldest and most respectable in Staffordshire. The founder, the late G. B. Thorneycroft, was at one time a working puddler, but having, besides a skilful pair of hands, a fertile brain, he attained a remarkable success, and established the present firm, which contains men well versed not only in the practice but in theory of iron making. These qualities they bring to bear on their works, and the result is the production of iron of such a quality that few can boast. They also roll larger sections of bars and larger plates than any other firm in South Staffordshire. Most attention was drawn to their plate-mills and the large merchant-mill on this occasion. These mills have reversing gear attached to them, so that the iron is worked quickly through the rolls, there being no need for passing the heats from the back of the rolls over the top to the front, as it is rolled each way, and there is, therefore, less labour required, and the iron is thoroughly manipulated while it is hot. A very large pair of cam-shears were seen in course of erection; these are intended to cut the edges of plates about 16 ft. long, at one stroke. From these works the party walked to those belonging to the Chillington Iron Company. Here they run the iron directly from the blast-furnace into the puddling-furnaces. This is certainly an economical plan, as the fuel used in ordinary puddling-furnaces for melting the iron is saved; but we should think that the quality of the iron is somewhat inferior, as it is impossible to tell what iron you are putting into the puddling-furnace. The blast-furnace may be burdened for a certain description, but we know it is almost impossible to guarantee the uniform production of that description, as a very little matter will effect the working of a blast-furnace. The quality of finished iron depends a great deal upon the proper selection of the pigs. We should also think that the continued tapping of the blast-furnace, to charge the puddling-furnaces, would tend to interfere with its working; but we must acknowledge that this is all surmise, and that we do not really know the results obtained from this arrangement. Griffiths's patent puddling-machines are applied to several of the furnaces, and are said to work well. They consist of a series of overhead shafting, worked from a small steam-engine. A rabble receives its motion from this shafting, and moves not only in a semicircle, but backwards and forwards, so that it travels over nearly the whole of the inside of the furnace, and well stirs up the iron. The only hand labour required is just to work up the very remote corners, and to ball the iron ready for taking to the hammers.

Whilst one portion of the visitors were at Wolverhampton the others were at the works of Messrs. Barrows and Sons, Tipton. The Bloomfield Works are of some historic interest, as in them the late Joseph Hall first successfully introduced the process of "wet puddling," or "pig boiling," and many other minor inventions of importance to the manufacturer of iron. There are over 2000 men and boys employed at these works, and the quantity of iron that can be produced is 1200 tons per week. The works are rather antiquated in design, but then they have been erected for very many years, and have been added to time after time, just as it has been required. The machinery is old fashioned, but good, and altogether the works are in a very creditable state. First-class boiler-plates, and good qualities of general merchant iron, are made here. Amongst other works in the same district open to the visitors were the Earl of Dudley's Coneygree Furnaces. This is certainly one of the finest specimens of blast-furnace plant in South Staffordshire, as it has been entirely remodelled during late years by the Earl's chief agent, Mr. E. Fisher Smith. There are three furnaces of the ordinary Black Country type, but more substantially built than is the rule. The native argillaceous iron ores, got from the estate, are alone used in the furnace for the production of forge pig, but best foreign ores are sometimes used as a mixture for making foundry pig. The material is taken to the furnace tops up an inclined plane, supported on timber framing. The ironstone is calcined in two large kilns, cased with wrought-iron, having an incline from the furnace yard to the tops, and a small horizontal engine draws, by means of a wire-rope, the stone and slack up the incline. From the sides of the latter screens are made to slope, and the coal or slack is drawn up a certain height and tipped upon these, from whence it deposits itself in large wrought-iron hoppers.

The calcined stone comes from the bottoms of the kilns into hoppers, and by the moving of an adjustable door is loaded into the barrows. The hoppers at the screens are fitted with the same description of door, so that a considerable amount of labour is saved. The gas is taken from the tops of the furnaces upon Addenbrook's plan. The tops are left open, and the gas is drawn off into a culvert surrounding the neck of each furnace through cast-iron framed openings by a large chimney or stack. The gas is taken from the culverts to the blast-engine boilers and hot-air stoves, through wrought-iron tubes lined with fire-brick. There are two blast-engines coupled together, having the blowing tubs under the steam cylinders. Two light beams are connected by parallel motions with the piston-rods, and have at their other ends connecting-rods working cranks fixed on a fly-wheel shaft. The fly-wheel is, of course, between the two cranks. The engines are both condensing, and work to a large degree expansively. We have already given in this Journal full descriptions of Messrs. Thorneycrofts and Co.'s works, the Bloomfield Works of Messrs. Barrow and Sons, and Earl Dudley's Coneygree Furnaces.

At the close of the second morning meeting the members of the Institute took train at Dudley, and went to Round Oak, where they alighted, and proceeded to the Round Oak Works, and were received by the noble proprietor, the Earl of Dudley, who was accompanied by Mr. E. Fisher Smith, his chief agent; Mr. F. S. Shenstone, the late principal agent; and Mr. R. S. Casson, the head manager of the Round Oak Ironworks. After the party had seen the splendid samples, and inspected the works, which we shall shortly notice, they adjourned to a marquee erected outside the works, and sat down to a magnificient luncheon, at which the Earl presided, and gave the usual loyal and other toasts.

THE LILLESHALL IRON AND COAL MINES, SALOP.

The South Midland Institute of Mining, Civil, and Mechanical Engineers (Wolverhampton) having been honoured with an invitation from Mr. E. Horton the manager and Mr. E. Jones the mining engineer to the Right Hon. Earl Granville and the other members of the famous Lilleshall Iron and Coal and Engineering Company (Salop) to visit the extensive mines and works of that concern, paid that visit on Friday last. The Engineers left Wolverhampton in saloon carriages upon the Great Western line at nine in the morning, under the guidance of Mr. Henry Beckett, F.G.S. (past president), Mr. T. Rose, and other members of the council, and Mr. Jas. Cope, F.G.S. (hon. sec.) They were met at Oaken Gates Station by Mr. E. Jones, to whom in his necessary absence from home Mr. Horton had deputed the sole direction of the day's business, the visitors in reality becoming the guests of Mr. Jones, who is himself a distinguished member of the Institute, as also are other responsible officers of the company. It soon became evident that every arrangement had been made for the visitors to obtain the fullest information. All the heads of the several departments of the vast concern were at their posts waiting the arrival of Mr. Jones and his guests, and having explained the leading features of their separate concerns accompanied the Institute from point to point, till all found themselves conducted by their *cicerone* to the entertainment that he had provided for them at his very pretty residence, Granville Lodge.

The magnitude of the concern surprised the majority of the party. They were unprepared to learn that the land which the Lilleshall Company owns and rents comprises a working lease of seven miles, and that year by year it raises half-a-million tons of coal and ironstone, which means the bringing to bank in that time of a million and a-half tons of subterranean Shropshire. Several of the visitors had a practical knowledge of blast-furnace management. To these the four hot-blast furnaces at Prior's Lee, and the five cold-blast furnaces at the Lodge, furnished many a wrinkle, even as the latter in particular had surprised those members of the Iron and Steel Institute who inspected them a few days before. It should be known that the Lilleshall Company's Lodge furnaces are the highest cold-blast furnaces in the world. Hot-blast furnaces there are that have been built 70 ft., and even 95 ft., but excepting by the Lilleshall Company no makers of cold-blast iron anywhere have been bold enough to raise their furnaces upwards one-third more than their original height. This change has been accompanied with the putting-up of four kilns, each 40 ft. high (after Mr. Gjer's plan), for calcining the ironstone, and the erecting of 80 coke-ovens, for making coke for the furnaces out of the washed slack coal of the collieries. Before the Lodge furnaces were raised they consumed 3 tons 3 cwts. of large coal to the ton of pig-iron produced. They now require only 2 tons 15 cwts. of slack coal; indeed, Mr. Wem (the manager) is now using only 2 tons 13 cwts. per ton of iron. Here is a saving upon the quantity of iron produced of 6342*l.* per annum upon the four furnaces that are alone in blast. But that is not all—the saving effected by calcining the ore in kilns, instead of the open hearth, is a farther profit of 2230*l.* a-year also in fuel. No wonder, therefore, that the company should be eminently satisfied with the result of their extra expenditure at the Lodge furnaces, when to all this has to be added the saving in labour-cost and material resulting from calcining the ore in the high kilns mentioned. Nor should it fail to mention that, excepting one-tenth hematite, all the ores needed are found in the five descriptions mined upon the Shropshire estates. Much of that one-tenth hematite the company also get upon their own property. They have recently purchased, and Mr. Jones is now developing, a hematite deposit in North Wales, which proves to be the richest hematite ore of which anything is yet known. It is worth 7*l.* a-ton, and enough of it will soon be worked to make the Lilleshall Company independent of all extraneous supplies.

All this the visitors learnt with much interest, inspected the splendid fire-brick operations and the peculiar bricks intended for blast-furnaces for Russia, went hastily through the extensive locomotive and stationary engine-shops and foundries, glancing at blast-engines for the North of England and elsewhere, pumping-engines for the Birmingham Waterworks, an extensive adaptation of Siemens' furnaces to the making of wire and screws by Messrs. Nettlefold at their new works in Shropshire, and were not surprised that an ironmaster from a distance should have ordered colliery locomotives during the visit of the Iron and Steel Institute. They needed not that Mr. Lloyd, who is the mechanical engineer of the company, should explain to them that he was much oppressed with orders, and that he was increasing the capabilities of his department as rapidly as possible.

It was to the mineral resources and the yet undeveloped portion of the company's property that the visitors seemed to give the most concentrated attention, for it is from what Mr. Jones is doing at his very successful new sinkings at the Granville, the Grange, the Whitemore, and the Stafford pits that the country must look for much of the light that is to clear up the darkness which at present overhangs the connection between the Shropshire and the Staffordshire coal fields. This we hardly need say is a question of momentous interest to the Black Country. Hence it is one that the South Midland have set themselves to examine, and, if possible, elucidate. Mr. Jones's explorations in all these quarters have had most gratifying results, although the workings are in ground which it had been usual to regard as barren of coal. At the Granville pits he has come upon the Lightmore fault, and is stripping it, but it certainly does not extend in a direct line towards the Stafford pits. Before it reaches that point it has made a detour towards the Cannock Chase district. There is not, however, immediate prospect of the other side of the fault being proved certainly for thirty years, inasmuch as the company has enough coal on the proved side of it to last them that time. At the Whitmore pits alone they have 1000 acres of the bottom and certain other coals, although some years ago the pits there were abandoned as having yielded all that was to be got.

The question, then, arises who is to prove the ground on the other side the Lightmore fault within a reasonable time? We fear no one. This comes about from the fact that the Lilleshall Company have the exclusive right of working it for a great distance on the Staffordshire side, even to a mile beyond the town of Shifnal. Mr. Jones, it is gratifying to know, believes that much coal exists there, though it may have to be sought in the bottom measure some 200 yards below where it is found on the Shropshire field side. The property belongs partly to Lord Stafford and partly to the Duke of Sutherland. From the first the company rent 4000 and from the Duke 7000 acres, whilst his grace is also a shareholder in the company. The Lilleshall Company may well be envied their splendid mineral possessions—for the Prior's Lee Hall estate, on the proved side of the fault, and adjoining the Stafford pits, is their own freehold, and they have not yet begun to work it.

All this information the visitors ascertained with great satisfaction, so far as it relates to the prospects of coal existing over the extensive sweep of country stretching between the Lilleshall Company's pits and the Cannock Chase district; and, seeing that so long a time is to elapse before the ground will be proved close on the Shropshire border, they indulged the hope that the trials which Mr. H. Jones (hon. member of the Institute), Mr. S. Bowkley, F.G.S., with the hon. secretary and other members, had suggested at the other edge, upon the property of Lord Hatherton, might soon receive the encouragement that was being looked for by capitalists willing to invest in a scheme of so much promise.

At dinner, at Granville Lodge, Mr. E. Jones took the head of the table, assigned certain of the other guests their places, and, at his request, Mr. Cope occupied the vice-chair. Amongst the company present were—Messrs. Beckett, Bernard P. Walker, T. Rose, C. Bromley, J. Randall, F.G.S. (hon. member), W. E. Gibbons, J. Bromley, T. W. Bridges, H. F. Griffiths, J. Lloyd, T. Wem, — M'Arthur, W. T. Beech, C. Green, A. H. Morris, T. Price, J. Laxton, J. Hodgkiss, B. Guy, G. Hyde, W. Underwood, H. Tolley, J. Hancox, Isaac Williams, James Williams, E. Phillips, S. Mansell, W. Grove, jun., G. Egglington, Thomas Perry, James Perry, J. Ferraday, T. B. Wilson, and others. The viands and the wines with which Mr. Jones bountifully entertained his guests were of the best, and musicians stationed in the tastefully arranged grounds played during the repast. After the customary loyal toasts, the Chairman gave "The South Midland Institute of Mining, Civil, and Mechanical Engineers," expressed his warmest wish for its prosperity, and the gratification he felt at entertaining its members and assisting them, if he had done so, in the laudable researches in which they were engaged. Mr. Jones then formally presented to the Institute a splendidly got up section of the sinkings of the company in the previously doubtful ground. The section was handsomely framed and glazed, and its dimensions are, perhaps, 5 ft. 6 in. by 2 ft. 9 in. Of this he asked their acceptance, with the hope that it might have a place assigned to it on the walls of the room of the Institute. The gift was received with great applause, and the past president and the hon. sec. said how delighted the council would be to assign it a most conspicuous place. Mr. Jones had designated the section as having "been carefully taken, a work of art, and of some little value." Mr. Jones was assured that the Institute would esteem it all this, and a great deal more, and that, coming from such a source, it would serve to constantly stimulate them in their anxiety to make their association one from which benefit might flow not to the members alone, but to the whole district. The hon. sec. also expressed the gratitude of the members to Mr. Jones for his very kind invitation and handsome entertainment. As to the Lilleshall concern and all its appointments, it had set an example to South Staffordshire, and to other districts likewise, from which much good to the iron and mining industries would issue. (Applause.) At the same time, he was perfectly convinced that the great amount of capital which had been laid out had been so judiciously expended that the company would be great gainers. (Hear, hear.) Mr. Jones regretted that the visitors had not had more time to go more particularly over the works, and said that if any gentleman then present or any other members of the Institute wished at any time to visit Lilleshall, either above ground or under, he should be most happy to afford him every facility and all the hospitality of his house. (Much applause). Adverting to the sinkings of the company, Mr. Jones said it had been said that they would come upon the great east fault; but, happily for Earl Granville and the company, it was no fault at all that they came upon, but all the lower series of coals, comprising 30 ft. in all, and yielding 35,000 tons an acre. (Loud applause.) Mr. Jones then bore testimony to those whom he termed "the master minds," who as engineers and and the like had brought the mechanical and iron-making departments of the Lilleshall property to the state of perfection it had now attained. Having said that the recent sinkings had cost the company 100,000*l.*, and the laying down of the 30 miles of private railway upon the estate another 100,000*l.*, Mr. Jones expressed a hope

that for the present they had done with expenditure, and had before them a long and continued time of reaping the benefit of that expenditure. (Applause.) Touching further upon the coal question, Mr. Jones said that probably the lower series would by-and-bye (when the company wanted to look for them 30 years hence) be found at a depth of about 500 yards in the wood that nearly skirted the limit of the ground that was now open. (Applause.)

Speeches were afterwards delivered by Mr. Rose, Mr. Randall, and others. Mr. Rose expressed his gratitude for the section, and Mr. Randall said how convinced Mr. Jones and himself were that coal would be found, as it was, over the Lightmore fault, which was only a clean-cut fault, like those often found in a coal field, but over which the coal was sure to be found, for it had been only cut off, and not altogether removed. Whilst others had been frightened to undertake explorations that promised great success, the Lilleshall Company had courageously taken them up, and under the guidance of a man of scientific as well as practical attainment had been most successful. (Applause.)

The Staffordshire members returned by a train which arrived in Wolverhampton at about 6 o'clock, but the Shropshire members remained longer to enjoy Mr. Jones's hospitality.

During their visit the engineers had their attention called to Robinson's non-conducting cement for covering steam-pipes that was being used at the Prior's Lee furnaces, and to a new steel wire for ropes that was shown by Mr. T. B. Wilson, who represented Messrs. Fox and Co., the steel wire-rope makers of Sheffield.

THE AWFUL EXPLOSION AT THE MOSS COLLIERY, WIGAN.

SIR,—Again we have one of those sweeping catastrophes which desolate a whole district—again we have the silent voices of 70 human beings, hurried at a moment into the never-ending future; without one moment's warning passed to their account; but their silent voices speak more powerfully than the mightiest volumes which tongues could utter; and what is their cry? Do they not ask the colliery engineer, the large number of mining managers, if they have, as a class, used every endeavour to avoid the catastrophes which are constantly befalling us; if every appliance which advanced science can bring to bear has been properly and judiciously applied? Do they not speak to the coalowners, and ask whether the managers employed by them are always fully competent to the difficulties with which they have to contend? Do they not also ask whether every effort has been made on the part of those who are reaping their fortunes out of our coal fields to educate the men who toil underground, to educate them in the knowledge of the dangers to which they are exposed, in the nature of the deadly gas which has breathed so much destruction, and with which they have every day to do battle? Do they not also powerfully, most powerfully perhaps, appeal to their fellow-workmen, scattered over the face of this country, and entreat them to use every means in their power to accurately acquaint themselves with the power, nature, and characteristics of the different gases which are constantly to be found underground, in order that in all cases they may be able to be prepared with a course of action which is judicious and safe in case of any sudden effusion of any of them?

It is not my intention to prejudge this case—that of the explosion at Messrs. Pearson and Knowles's Moss Lane Pit, at Wigan; but there are several salient points which cannot fail to strike every enquiring mind. In the first place comes the enquiry, "Is it necessary that we should be visited again and again by the terrible destruction of life which is constantly recurring in our coal fields?" During the last ten years the Wigan coal field has gained an unenviable notoriety from the frequency of the explosions occurring there. Also the Barnsley Thick, or Nine-feet seam, has been frequently visited. They have, therefore, gained the reputation of being very fiery, or containing very large quantities of gas. Such is undoubtedly the case, but have we no cases of fiery mines where large quantities of gas are evolved from the coal, and where it is passed off without injury to life or property? We have had brought before us during the last twelve months an old seam of coal which has been worked for nearly a century, but which has lately developed a new characteristic—outbursts of gas. Till within ten years this phenomenon was almost unknown in that seam—the Silkstone. Mr. Miller, in a paper read before the Midland Institute of Mining Engineers, recounts two outbursts in that coal at the Strafford Collieries, which completely filled the pit with gas. By the excellent arrangements of the colliery it was, however, passed harmlessly away. Some time after Mr. W. H. Chambers, of Thorncliffe, in a paper read before the same institute, gives us an account of five outbursts in the same coal at the Thorncliffe Collieries. The first two were explosions which occurred in 1862, the men working with candles, as an outburst was unknown in this seam prior to that year. Since then no explosion has occurred, though the outbursts have occured frequently, and with increased violence. One in August, 1870, was so violent that one district of the pit was charged with gas for 18 hours before being ready for work again. The number occurring there between the beginning of 1863 and the present time has been about eight, and all without any loss of life or injury to property. In the Oaks Colliery since the explosion, whilst the pit has been re-opened, there have been two outbursts, which have been encountered without any loss of life or injury to property. These instances drive us to the conclusion that where all the advantages which science and proper management can give us are adopted, coupled with a knowledge of their danger, and judicious action under such danger on the part of the men, there is no necessity that we should be visited with such desolating catastrophes as the one which has lately occurred.

By what steps, then, are we to gain immunity from such accidents? It has before been suggested that every manager of a colliery should pass examination, and have a certificate given to him of efficiency. Though not seeing that such a plan could be enforced on all coalowners, there is no doubt that if such a scheme as the granting of certificates by Government were adopted great benefits would result, and that we should soon see an improvement in our mining managers as a class. Unfortunately in many districts and at many places it is thought that anyone has brains enough to manage a colliery, whereas there is no branch of trade which requires such careful study, such skill in adapting the knowledge acquired to the varying circumstances constantly arising from day to day, and where science has so great a scope for applying itself as in the economical and safe working of our collieries. The examination of candidates should be rather with an object primarily of testing their practical knowledge; secondly, in reference to their scietific requirements. For though I have frequently known a practical man to manage a colliery with great advantage to his employer, and with little loss of life, he having at the same time few scientific acquirements, it has never been my privilege to see the purely scientific man try his hand without coming to grief ignominiously.

I have said that the workmen ought to be educated in the nature and properties of those gases in which they have constantly to work. This has been a point sadly neglected amongst our mining population. There are thousands of our colliers who are totally ignorant of the properties of the gas among which they work. They are totally ignorant of any of the air-courses or workings of the mine, knowing no other road in the pit except the one which leads to their working place, for there is a rule which keeps a man from entering the working place of another, a rule both necessary and judicious. But surely this is no reason why he should not be made acquainted with the workings of the colliery—with the shortest way out of danger in case of any accident. There have been instances of men who have worked in a mine the whole of their lives who, on a slight explosion, have been killed through running into danger instead of away from it, and this from entire ignorance of any other road but the one to and from their working place.

Who was to blame for these lives? Surely not the men themselves; they were forced, under severe penalties, to be ignorant of the other workings of the colliery, and through this very ignorance, enforced upon them by Government law, they lost their lives. The giving of plain, easy, and simple lectures on the different departments of colliery work has been adopted at several places in the Barnsley district, and great success has attended them. It would well repay coalowners to establish a system of this description throughout our coal districts. Again, in our schools there is great necessity for the children being taught the nature of mining whilst young. Separate classes for instructing those who are intended for pit life, to be taught what a coal pit is and all about it, would be of immense use. At present, as a rule, with all deference to the Government teachers appointed to our National Schools, they are lamentably ignorant of what a colliery is. There should be competent teachers, assisted by maps, models, &c., to give the requisite instruction in such knowledge as would be useful to the children in after life. In many districts father, son, and grandson succeed one another at the same colliery. To teach the child the plan of working, &c., and the plan of part of the collieries ajacent, would be very advantageous, having them, of course, closed against other inspection, and protected from copying. This would place our future colliery population in a position to aid the manager in every effort to procure safety for themselves and economy in work, instead of, as is now the case, often offering obstacles at every turn, and this most frequently through ignorance, or lack of proper knowledge of the danger to which their error exposes them.

These are suggestions which naturally arise on the occurrence of another of those terrible explosions which from time to time startle us by their violence and fatality. How the colliery owner may aid in carrying out those suggestions will occur to every thoughtful mind. And what immense advantages will arise if by these means anything can be done to lessen the frequency with which they occur. At the inquest we shall no doubt have a full and fair enquiry into the cause of the explosion in question. The amount of ventilation appears in the main returns to have been large, but the more important question of its distribution through the workings will no doubt be one of the first considerations. The discipline of the colliery will no doubt have the closest examination, as this is of the utmost importance. The kind of safety-lamps employed will be a matter of considerable interest. We shall wait with anxiety the enquiry; in the meantime, should not the attention of coalowners, managers, and workmen alike be turned to placing themselves in a position of greater immunity from these withering calamities? That such position is possible of attainment we are convinced. That we should remain still subject to such numerous explosions must, therefore, be a reflection to all connected with our mining interest.

Wigan, Sept. 15. A MINING ENGINEER.

COAL-CUTTING MACHINERY.

SIR,—In the Supplement to last week's Journal an article appeared under the head of "Improvements in Coal-Cutting," which purported to be a summary of a paper read by Mr. W. Hoole Chambers at the last meeting of the Midland Mining Institute. Mr. Chambers appears so utterly to ignore my inventions, and the claim which I assert to be the most practical man who has so successfully studied the subject, that I must beg your permission in this manner to reply to the remarks of that gentleman. He makes mention of "the curved pick" as the fourth of those recent improvements which have gradually led to a coal-cutting machine being invented which is "a decided success." In my specification, dated April 29, 1865, number of patent 1203, the curved pick is described for the first time by any inventor, and I feel regret that Mr. Chambers was not ingenuous enough to give me any credit which attaches to it. He makes an effort, however, of that kind in favour of Mr. Samuel Firth. I do not stay to discuss the motives there may have been at work for suppressing my name and extolling Mr. Firth's, but he goes on to commit what I submit is a still greater injustice. As to "the successful application of loose points to the pick, perhaps the greatest improvement of all," Mr. Chambers says, "the specification of Samuel Firth, No. 943, 1869, claims a loose point by preference," &c. Now, Sir, Mr. Chambers ought to have known that my specification before mentioned, No. 1203, of 1865, contains these words:—"The point of the pick is made portable, and is fixed with a colter, so that one noose, or point, may be exchanged for another when requiring to be sharpened." I maintain, therefore, that I invented and patented the use of those loose points which are admitted to be "perhaps the greatest improvement of all," four years before the date of Mr. Samuel Firth's specification. This patent of mine is still in full force.

Mr. Chambers, in his paper, also makes mention of "a false bottom," as a means of enabling a machine to hole at any height in the seam; and he described its admirable accommodating qualities. Now I hope, Sir, that you will let me do myself the justice to say that my machine (No. 1203, of 1865) has a bottom arranged so as to raise the picks to the required position for cutting the grooves in the coal or mineral. All that I wish by these remarks is to uphold the position as an inventor to which I am entitled. I had hoped that when I came so successfully out of a prolonged lawsuit, less than twelve months ago, all the claims which I have here set forth would have been generously, not to say justly, admitted. Finding, however, that such is not the case, I have placed the matter in the hands of my solicitor to take whatever steps may be needful for my protection. WILLIAM LEATHAM.

Brookfield Engine Works, Hunslet, Leeds.

OUR FUEL SUPPLY—COMPRESSED PEAT.

SIR,—Your paper has lately contained some articles of the highest interest on the subject of the probable duration of the supply of coal in England.

I will, however, venture to observe that one question, which may have a most important bearing upon the consumption of coal, has as yet been insufficiently examined into—the amount of fuel which Ireland can supply from the immense deposits of turf in that island. Turf, it is well known, can be so compressed that 25 cwts. is equal, for economical or manufacturing purposes, to 20 cwts. of average coal. Hitherto the attempts to produce this compressed turf have, I believe, not been financially successful, in consequence of the competition of coal at low prices, but it is obvious that any considerable rise in the value of coal would alter the state of things. In Bavaria the successful working of such undertakings has, I am informed on the best authority, doubled the value of estates to which considerable quantities of turf are attached.

I have not at hand any accurate statistics as to the extent of the turf bogs in Ireland, or the thickness of them, but on some property belonging to me, adjacent to the great bog of Allen, the turf is more than 30 ft. thick, probably much more. If we suppose an average thickness of 30 ft., an acre would contain 48,400 cubic yards. In Ireland there are about 4,500,000 acres of waste land; if only 1,000,000 of these are bog of 30 ft. in thickness (and many of the largest are known to be 40 ft., and even 50 ft. in thickness) we should have 48,400,000,000 of cubic yards. These attempts at statistics are, of course, little better than guesses; but I think they show that the question is one of national importance, and well worth close enquiry. It is beyond question that any ample supply of compressed peat would have a material effect on the consumption of coal, and the probable extent of such supply is, therefore, a most important factor in the calculation of the probable duration of the coal supply.

AN IRISH LANDOWNER.

COMMERCIAL TONTINES.

SIR,—After the very favourable statements concerning commercial tontines published in the Journal a few weeks since, I have been surprised to find that no company has been formed upon the principle laid down, or, perhaps I should say, that no existing company has attempted to avail of its provisions. There are numerous companies possessing all the elements of success, yet languishing for want of funds to do some necessary work. This is the more curious, as the Mortgage Debenture system seems to be just now in considerable favour, although a more delusive system could scarcely be found, especially when, as in the case of a Cornish concern, recently projected, the vendors take a proportion of the debentures as part of the purchase price. The fallacy is transparent. The capital is fixed at 5000*l.*, nine-tenths of which is called 15 per cent. preference stock and one-tenth ordinary, but each 10*l.* certificate (or its equivalent) represents 1*l.* ordinary and 9*l.* preference stock combined, and of this combined stock one-half is taken by the vendors. Now, the difference between this vendors' stock and ordinary fully paid shares is absolutely nothing; both are equally vendible without restriction, and, consequently, flood the market to an equally prejudicial degree.

The position of the holders of stock of this kind is very similar to that of a man who attempts to become his own mortgagor, the difference being that in the mortgage debenture system the mortgagor does not even retain power over his own property; so that whilst he is sure to lose in case of non-success, it does not at all follow that he will win in case of success. The commercial tontine system is precisely the reverse of this—the investor receives back his money, and, therefore, loses nothing in case of failure, but is largely remunerated in case of success. F. C. B.

AMERICAN MINING SPECULATION.

SIR,—The collapse of the Independence Gold Mining Company of California, introduced to the public last week under the auspices of the self-constituted Mining Bureau of California, showed what little confidence the investing public and the Stock Exchange have in the recommendations of this body, whom the "Money Editor of the *Times*" has more than once held up to the British public as the only great reliable mining authority of America, and through whom such business should alone pass.

The lesson taught by the non-success of the above-named company is simply as follows:—That the class of directors and stockbrokers who have been, and still are, subscribing the capital for American mines entirely repudiate the idea of any such authority on mining matters, and if anyone would take the trouble to fairly and honestly investigate the standing and position of the brokers and directors interested in this class of business they will invariably find that they are men of great experience and large capital, and who make a thorough investigation for themselves before they add their names to, or put their capital into, those ventures. It is to be hoped we shall in future hear but little from the *Times* about the immaculate Bureau of California, for it is certain that although this combination has been so strongly supported in the Money Article of the *Times*, yet its supposed weight and influence has not had the desired effect of drawing subscriptions from the Stock Exchange or the general public, and I have no doubt some plausible excuse may be given to the statement made in this letter as to the collapse of the aforementioned mining company, but it is well known and understood in and around Threadneedle-street that if the capital had been subscribed the mine could and would have been bought.

As to the merits of the Independence Mine, I believe the property to be fairly good, but it is not my purpose to discuss them at this moment, but only to point out what little influence the reports of this mining bureaucracy of California have on this market, even with the very full endorsement of the *Times*, as the naughty boys of the Stock Exchange will invest their money in American mines, &c., in spite of the strong remarks of the City Editor of our most influential daily paper. It may be that those gentlemen are rash, but if so, they have amongst them many who are well known to be men of great respectability, as well as possessing large means, and who are sufficiently powerful to carry out any venture they thoroughly believe in. And if any person interested in this business would search the list of directors and brokers connected with many of those mining properties, they would find the names of gentlemen who could and would (if necessary) subscribe the whole amount of the capital of the companies they connect themselves with.

The everlasting and weekly grumbling of the *Times* over this class of business seems to have no effect, as last week we were informed by their new authority (Mr. Rae) that there were formed in London, during the last year, mining companies having a capital of upwards of 1,000,000*l.* sterling. This is a fact; and the value of the stocks of many of those companies has doubled itself during the present year; and I would strongly advise Mr. Rae not to join a "bear" operation in them, as they are generally well held, so that if he should be bold enough to attempt to play with them, he might, perchance, burn his fingers.

All who have taken a leading part in this business claim the right of investing their capital how it may please them, and of the manner of so doing they consider themselves to be the best judges, and will not allow stupid prejudices to stop them. Those less experienced in those matters would, on reading the Money Articles of the *Times* during the present year, think that 90 per cent. of the capital invested in American mines was being found in England, which is not the case, as 10 per cent. would more than cover the amount of the investments in such properties in England; but it is quite evident that if the present standard of those mines be sustained for another year there would be a steady increase of investment in American mines on this side of the water. HUGH H. ROCHE,

European and American Agency, Palmerston-buildings, Old Broad-street.

AMERICAN MINES, AND ENGLISH CAPITAL.

SIR,—I have read with much pleasure your excellent Editorial on "American Mines, and English Capital." There can be no doubt but that in a new country like America many valuable deposits of silver ores will be found, and considerable profits shown as the result of working them. But these at best will constitute but the ephemerals of mining, and cannot be classed with the staple sources on which that great and important industry reposes, and from which it appeals for its credentials, without which it could not be entitled to public patronage. Whatever may result in particular instances from the development of "comparatively" undeveloped properties at the time of purchase, and for which large sums of money were paid, it is highly probable that the majority of such class of investments will give, in the long run, results anything but satisfactory. I have long wondered at the perpetuation of such an oversight, differing but little, if anything, from sheer imprudence—the giving of heavy sums of money for comparatively undeveloped mines. It might be well enough to purchase the fee simple of a mine when it was ascertained that the dues, or royalty, amounted to an excessive interest on the sum at which the fee simple could be bought.

The proposition to adopt the European method of adventurers providing the necessary capital to work mines, and to pay a reasonable proportion of the product thereof to the respective owners, is fraught with so much fairness that the most fastidious reason could not withhold from its endorsement. There may be particular instances when the owners of mining properties may be able to show satisfactory reasons for their desire to sell in preference to leasing them, independently of any misgivings as to their value, but the majority would be unable to adduce sufficient reasons for such a preference. But be this as it may, the preferences of vendors merit no consideration as the hands of vendees, as the immediate interests of either are usually diametrically opposed to the other. It has always excited an involuntary repugnance in my mind the payment of such large sums of money as are sometimes, and not unfrequently, paid for mining properties which are anything but established productive concerns, amounting at best to nothing more than desirable speculations. The variable nature of mining is such that it is impossible in the best established instances to separate it in idea or fact from speculation, and where speculation exists risk is inevitable. Avaricious as mankind has grown to be, the question who is entitled to a fair share of the profits of an enterprise, when profits accrue, more than those by whose energy, judgment, perseverance, and outlay such profits have been brought about, it will always be exceedingly difficult, if not impossible, to answer affirmatively.

Land in the mining districts of Nevada—the State from which I write—is, in a majority of instances, utterly valueless for agricultural purposes; and in the adjacent valleys, where fertile soils abound, water is so essential as an invigorator, and rain so seldom falls, that the richest soils are incapable of sustaining and maturing the ordinary cereals, independently of incessant irrigations from seed-time to almost harvest, and water for such purposes is not unfrequently much more than scarce; but if it were otherwise—in the absence of mining—no market would be found for agricultural produce. It is therefore, clear that the development of mining must precede that of the other natural departments of material wealth, and pioneer agriculture itself. I very much question if anyone could be found with aspirations so low as to settle in the most fertile valleys in the part of the country to ply their avocations as agriculturists, unsupported by mining. It would be to degrade themselves at once, and connecting links between barbarism and civilisation—that of the stone and iron ages, with the stronger tendency to degenerate, as no manufactures, in the absence of mining, could ever, in all probability be attempted. It, therefore, depends upon mining. But that industry, properly prosecuted, would sufficiently and satisfactorily compensate for all that nature has denied it in other respects. I am fully

convinced that the relations you propose to establish, of Landlord and Adventurer, in respect of mining in this part of the country, would do more to develope its resources, and benefit all parties concerned, than the multiplication of sales twentyfold under existing auspices.

Acting on the basis you have proposed, the interests of both parties would become inseparably identical, and that of the lessor as well as lessee, would be but promoted by the quality of the mines on which both parties would mutually depend for remuneration and profits. It appears to me to be utterly repugnant to reason that anyone possessing a valuable property undeveloped, and themselves lacking the means of its development, could for a moment decline to permit others to do so, guarded by stipulations legally binding, and secure to the lessor in all cases a fair, and in some cases a handsome, percentage of the products or profits, as may be agreed on, amounting, in a great number of instances, to a large income, even when divided amongst several individuals. I think it may be taken for granted that parties refusing to allow their mines to be worked on a percentage of the product thereof, free of all expenses but those incident to the reduction of the ores—their own share of the ores—can have but little or no confidence in the productive qualities of their mines, and may, therefore, be passed by without much apprehension as to the consequences.—*Nevada, Aug.* 23. A MINE OWNER.

THE *TIMES*, AND MINING ON THE PACIFIC COAST.

TO THE EDITOR OF THE TIMES.

SIR,—Your article of Tuesday last contained a lengthy extract from a work by Mr. W. F. Rae, in which an irresponsible author deals somewhat freely with some rather important mining interests. Among these he pointedly refers to the Eberhardt and Aurora Company, respecting the history and past experience of which my knowledge is probably equal to that of the author. His purport is to show that English capitalists have of late either become less circumspect and prudent, or American owners of mining properties have grown more ingenious and plausible, for the eagerness of the former to purchase such properties is only equalled by the readiness of the latter to part with them. Quoting from a recent scientific and official report upon the White Pine district generally, and the Eberhardt Mine in particular, the statement appears that this particular deposit is the most remarkable occurrence of horn silver on record; but after referring to the marvellous results obtained during the early days of its development, he ventures upon two distinct assertions. First, that no such treasure trove now rewarded the patience of explorers; secondly, that the average richness of ore, which had at one time been £5000, had now declined to £40 per ton.

Let it be for a moment admitted that each statement is correct, how is it the want of circumspection and prudence proved thereby? The calculations upon which the purchase was made happens to have been based upon this very figure of £40 to the ton, and went to show that, taking this as an average richness, the entire purchase money would come back to the buyers in about 2¼ years. But are the author's statements borne out by the positive results obtained since the property came into the hands of its British owners? These results demonstrate that instead of having purchased skimmed milk supposing that they were buying cream, they, on the contrary, have paid the price of skimmed milk, and the experience of each succeeding month has been more and more convincing that a large and apparently an increasing quantity of rich cream has come into their possession. The latest intelligence establishes the discovery of an enormous mass of what I might call clotted cream. It contains important quantities of ore much richer than the assumed average. It is, moreover, especially to be noted that this chamber of ore appears in a portion of the old North Aurora mine at a depth of between 100 feet and 200 feet, a fact confirming other facts which might be adduced to negative the idea that these are in reality mere surface deposits.

So much for the eager indiscretion or imprudence of British buyers. One word as to the ingenuity and readiness of American sellers to part with their mining property. The vendors of the Eberhardt and Aurora Mines not only accepted one-half of the purchase money in paid up shares of the company, but covenanted to hold 50,000*l.* worth of such shares until the month of June, 1872, before which date no transfers whatever in respect of these shares will be made by the company.

It very possibly is true that while negotiations were pending, and great secrecy was purposely observed, the miners of the locality expressed the unfavourable opinions of the Britishers which the author mentions; but I venture to state that it is no less true that not very long after the new company had proceeded to develope the mine the language held among the miners was to the following effect:—"Hanged if those darned Britishers did not know more than we did, and have got the cream of the hill, and are going to do well."

It is only just to add that as early as October last the company's devoted and excellent officer then in charge of the property expressed his confident opinion that the mine would be a great and an honest success, and that some of the richest discoveries in the hill would be found in that very portion of the old mine where the chamber referred to above has proved the boldness of the author's assertion that no such treasure trove now rewards the patience of explorers.

I have said enough to show the danger of conclusions drawn from such casual information as an enquiring author may obtain and publish. A case like the Eberhardt can only be judged of by those who have the necessary opportunities, tact, and qualifications for a careful and large accumulation of facts. Without these advantages even high scientific authorities may be puzzled. The miners years ago asserted that the White Pine deposits formed a special and anomalous feature in mining experience. The ready reply came that anomalous and special features paid best in the mining market, and nothing in the case presented itself that did not admit of easy explanation. How stands the case now? The soundest authorities, reporting under a sense of professional responsibility, express themselves in those cautious and well balanced terms which make it clear that in their minds the weight of evidence points up to this time in the very direction to which the practised miners drew attention years ago. In the case of a recent most able and searching report by Mr. James D. Hague, the find suggestions offered for the prospecting and development of these properties, which, though given in more elaborate and scientific terms, substantially corresponds with the advice which the vendors of the Eberhardt have all along given as the result of their practical observation and experience.

I will not encroach upon your space by showing in detail how much of rich ore has been already secured, or the quantity or value of that contained in the ore now waiting to be crushed. Neither is it necessary that I should point out the proportion which such value bears to the total cost of the property to the present owners. Enough has, I trust, been said to satisfy your readers that this case is the very last which should be cited in proof of the imprudence of our countrymen having been overmatched by American ingenuity.

Let me, in conclusion, express the hope that you will grant insertion to the present, both on account of the importance of the interests which are practically involved and of the justice with which you ever recognise the principle of—

AUDI ALTERAM PARTEM.

THE CAPE COPPER MINING COMPANY.

SIR,—Absence from England prevented my being present at the annual meeting of this company, which is reported in the Journal of Aug. 26. I observe, to my astonishment, that Mr. R. Taylor is reported by you to have stated that "Mr. Woodifield was aggrieved that his services should not have been retained, so he had forwarded a printed letter to the directors giving his account of the deficiency of the ore, which letter was now on the table."

As this statement is likely to convey an erroneous impression, I beg leave to state that I never forwarded a printed letter to the directors, but, having addressed them with reference to their circular of July 22, and I received from them, by resolution passed by them Aug. 11, permission to lay my letter before the general meeting, should I think it desirable to do so. Mr. Taylor's deduction that my writing to the directors had any connection with the retention of my services is utterly destitute of any foundation, since it was well known to all my friends that, even had my health permitted my so doing, I had fully resolved not to resume office after the expiration of my engagement, and which engagement terminated on March 1 last. M. WOODIFIELD.

Buckingham-street, Strand, Sept. 14.

THE SWANSEA SMELTING AND SILVER MINING COMPANY.

SIR,—The directors of this company have issued a circular, stating they have received such satisfactory accounts from Colorado that they deem it advisable to be prepared to complete the purchase without delay, and have, therefore, made a call of 17s. per share. If they have nothing more satisfactory than they communicated in the circular enclosed it would be well, first, to call a meeting of the subscribers, and take a vote as to whether the purchase should be concluded or not. With respect to the mines, all the information vouchsafed is contained in one line—"Mr. Pearce had only been able to make a preliminary examination," but says "the Prince Albert lode gives indications of a very promising character." This is very vague, and I submit does not warrant the directors in going on with the purchase, as in their properties they place the value on the mines alone at 20,000*l.* per annum. If there are only "*indications* of a very promising character" I should like to know where the 20,000*l.* profit is to come from? They also estimate the profit on smelting ores at 10,000*l.* per annum, but it seems from the report that the present capacity of the works is only "about 6 tons per day." Now, allowing them to work 300 days in the year, this would only be 1800 tons a year. I think most of the subscribers will consider that 35,000*l.* is far too much to pay for mines giving only "indications of a very promising character," and works of such a limited capacity as to be only equal to smelt 6 tons a day, which, although it were all profit, together would not pay 5 per cent. on the capital.

After what has occurred with South Aurora, it behoves investors to be particularly careful before they commit themselves to American mines, and I think there is nothing very promising in this undertaking, unless the directors have further information, which the sooner they submit to a meeting of subscribers the better, as I would much prefer to lose my subscription rather than go on for the future.—*Glasgow, Sept.* 12. A SHAREHOLDER.

GASES IN METALLIC MINES.

SIR,—With reference to the communication under the above heading, which appeared in the Supplement to last week's Journal, I find from further information that the gas referred to by Capt. J. Barkell is most probably carbonic oxide, or "white damp," a gas which burns with a beautiful blue flame, but gives but little light, although when mixed with air it burns brilliantly, and evolves a light clear and intense. It exercises a baneful influence upon animal life, whilst, at the same time, it may cause candles immersed in it to burn with unusual brilliancy; and it cannot be too carefully borne in mind that although air in mines may support combustion, it may yet be highly deleterious to animal life, however contrary to popular opinion it may be. Were the gas alluded to ordinary fire-damp, which is a dicarburet of hydrogen mixed with air (not a sulphuret, as reported in the letter), it would probably be explosive before it would cause inconvenience to men working in it, which is not the case in the mine in question. The presence of certain gases in metallic mines is usually regarded with favour, as generally indicating the presence of the elements which have contributed to the deposition of ores.—*Water-street, Rhyl.* ABSALOM FRANCIS, M.E.

TRIBUTERS' ORES.

SIR,—I am sorry I have been unable to give the particulars, in answer to "Average Stater," in the Journal of July 29, regarding Tributers' Ores, earlier. I should, however, feel greatly obliged if you would insert the annexed division of the parcel referred to in an early impression, as it may lead to a more satisfactory set of Tables being published. The Standards for the five parcels of tributers' ore are, according to Mr. J. Hitchins's Tables:—

	Dry ore.	Produce.	Standard.	Price.	Wrong amount	Decrease 1s. 10·154d. in 20s	Real amount
No. 1..	lt. 15c. 2q.	7¼	£98 3 5	£4 7 4	£7 11 9	£0 14 0	£6 17 9
2..	16 11 2	5½	105 17 10	2 13 6	44 5 4	4 1 8	40 3 8
3..	6 7 2	8¼	95 18 9	5 3 3	32 16 4	3 0 8	29 15 8
4..	5 11 2	7½	97 11 0	4 11 3	25 6 2	2 6 8	22 19 6
5..	9 3 1	6¾	99 11 0	3 19 4	36 6 3	3 7 1	32 19 2
	39 7 1				146 5 10	13 10 1	132 15 9
Public parcel.	39 7 1	6	102 1 0	3 7 6			132 15 9

The returning charge is 55s. in each case.

By dividing the sums under the head of "*real amount*," it will be found that No. 2 was paid at 9s. 5·7375d., and No. 3 at 11s. 4·29d. per unit. The sums I gave before—viz., 10s. 6d. for No. 2 and 12s. 6d. for No. 3—were the prices per unit before the "*drawback*" had been deducted, the difference is still nearly 2s. I may say our ores are not sold in the Ticketings; but our standards are governed by ores raised exclusively to the west of Truro, in the following manner:—

The public parcel being of 6 produce, we took particulars of all ores from 5½ to 6½ produce in the Ticketing Paper dated May 4; the result was a standard of 102*l.* 1s. as shown in the example given, the price per ton given by the buyers being 3*l.* 7s. 6d.

I shall be happy to give any further particulars or examples whenever required.—*Coniston Mines, Sept.* 11. B. S.

THE MINES OF CARDIGANSHIRE, AND THEIR INEXHAUSTIBLE TREASURES.

SIR,—Being confident that you will endeavour to find a space for all that may concern legitimate mining, and every thing connected therewith, I thought I could not devote a short leasure better than to send you a brief account of the leading mines in this county. I will go back 36 years, when my late brother (Mathew Francis) took the management of the Lisburne Mines, also the Gogerddan, and soon after the Goginan Mine, for Messrs. John Taylor and Sons.

At the time I now speak of the only good mine, and profitably worked, was the celebrated old Cwmystwith, then very rich, returning from 150 to 170 tons of lead ore monthly, by means of small 15-in. crushers. About 25 tons per month was then being returned only from all the Lisburne Mines, and about 20 tons from the Gogerddan Mines, comprising the East Darren and the Old, or Great, Darren. In each of these cases the ore was crushed by similar sized crushers as at Cwmystwith. The Cwmystwith Mine continued rich all the time that Mr. Lewis Pugh held the leases, or at least to within about 18 months of the expiration of the leases; but when it became known to Mr. Pugh that the leases would not be again granted to him he, of course, took out every particle of the paying ore, and left the mines comparatively poor. The management was then given to my brother, and after some difficulty in the sinking of Francis's shaft, supposed to be insurmountable, that difficulty was at length overcome, and a great course of ore laid open, which continued the mine in a state of great prosperity for very many years. The mine is now comparatively poor, and the reasons for its being so will be hinted at at the close of this letter.

The Lisburne Mines, under the firm of Messrs. Taylor and Sons, and the management as before stated, quickly laid open immense courses of lead ore, and machinery was erected capable of carrying on all necessary operations during the terms granted by the new leases. The Gogerddan Mines gave greater returns, and the foundation was laid for their becoming rich and profitable. Goginan was started, and required only 500*l.* to bring it into a state of dividends, and in a short period returned as much as 230 tons of silver-lead ore per month. I should here remark that machinery in all these cases was erected sufficient to work the mines for the term of the leases, or 21 years.

Soon after the success attendant on the development of the mines here spoken of many others commenced working, amongst them Cwm Erfin, Cefn Brwyno, Bronfloyd, &c.; so that in a short time the returns, which at first did not exceed 200 tons per month, soon reached about 1000 tons, and the profits on the capital subscribed were immense.

I am not going into the many new mines that have recently been opened, with every prospect of success—and I need not speak of a "prospect" of success, for that is certain if the mines are properly developed, or laid open, and which it is to be hoped may be the case for the sake of the shareholders, the miners, and the landowners.

I am not one of them who would for a moment uphold those most extravagant and ridiculous clauses inserted by the Commissioners of the Crown, claiming one-fourth part of the proceeds of sale, &c., which has tended to the abandonment of nearly all their mines in this country, but if I were a land proprietor I would insist on having a clause in every lease granted, providing that when a course of ore should be found in paying quantities the engine-shaft should be deepened at least 5 fathoms in every twelvemonth: 10 fathoms could easily be sunk every year, and in every mine in the county. Although the principal mines in the county, comprising Cwmystwith, the Lisburne Mines, being Glog Fawr, Glog Fach, Level Fawr, Frongoch, and West Frongoch, with some other mines unworked. The late Rheidol Mines, Goginan, Bwlch Consols, East Darren, South Darren, Cwm Erfin, and Bronfloyd have undoubtedly been worked for centuries, and all of them now comparatively in their infancy. It will scarcely be believed that with the exception of the latter mine neither of the others havs been sunk an inch for very many years past. At Bronfloyd the mine during the last four years has been sunk from the 45 to the 84 fathom level, the engine-shaft now being sunk at the rate of 3 fathoms per month, until it shall have reached the 100 fathom level. Had this not been the case Bronfloyd would be worked under similar management to the others—capable of giving only one-fourth of the present profits and dividends. The flooring and other arrangements at this mine is an example which should be followed by every great and good mine in the county. All praise to whom praise belongs, say I; and although, by-the-bye, I hear Mr. Balcombe has no good word to speak of anything that I am connected with, that has no influence in keeping me from expressing what I consider is due to him. A short time will convince him, and other doubters, whether the Rheidol Valley will not be teeming with as rich mines as ever were worked in Cardiganshire.

The most surprising thing is that all the other mines have not worked themselves to a standstill, for, beginning with Cwmystwith, I believe I am right in saying (and if I am wrong undoubtedly the dates will be put right) the mine has not been sunk an inch for the last 10 or 15 years; that neither Glog Fawr, Glog Fach, or Frongoch has been deepened for a similar term of years; that the Rheidol Mines, although in course of working for 30 years, has not been sunk for very many years, and has not acquired at the deepest part so deep a level as the sea level; that old Goginan has not been sunk 1 foot for the last 15 or 20 years; the same at Cwm Erfin, East Darren, and South Darren, and that the Bwlch Consols has been to the present depth for the last five years at least: it will appear to all impartial parties that were these mines carried out fairly, and sunk as the Cornish mines are, they would become the greatest, the richest, and the most lasting mines ever opened in the Principality, or I may safely say in the kingdom. The profits would be quadrupled, together with the cost paid for labour, whilst the lords of the land would be receiving that, and that only, to which they are entitled.

To sum up all, the great secret is the insufficiency of the present machinery to work such veins as those described. If this be not soon attended to, the effect on these mines will be more ruinous than heretofore; but if attended to, and the mines fairly managed, they will not fail in doing all that can be expected or desired, and instead of giving dividends at the present rate would pay the shareholders fourfold.—*Goginan, Aberystwith, Sept.* 12. ABSALOM FRANCIS.

UNDEVELOPED MINING DISTRICTS.

SIR,—There are some persons who assert that the mineral resources of Cornwall are almost exhausted. This opinion was originated by the failure of some of the great mines, such as the Consolidated, Clifford Amalgamated, and some others in the Gwennap district; Fowey Consols, Par Consols, and some others in the St. Blazey district, &c. Never was a greater mistake. Although of late, and at the present time, the production of copper ore is so small as to reduce weekly to bi-weekly sales, yet there are, without doubt, many copper lodes unexplored, and many very partially tested, that have been discovered. It is true that many of the lodes which were formerly productive have been practically exhausted; but discoveries of other productive lodes may fairly be looked for. Even in Gwennap, once the best district in Cornwall, there is much untried ground. There is ground to the north of Wheal Squire of this sort, and all the ground between Wheal Squire and Pengreep. Little has been done in Tresamble, &c. Gwennap and St. Blazey will see good days again, and so will Crowan and other districts now almost idle.

There are some stanniferous portions of Cornwall scarcely operated on at all, but which are now receiving the attention of capitalists—Castle-an-Dinas and St. Stephens districts. In the former several setts are now being worked, and others are about to be worked. Castle-an-Dinas Mine, Roche Consols, Great Royalton, Brynn Royalton, Brynn, Belowda Hill, and Castle Gate Mines are at work under the management of Capt. Thomas Parkyn, of Roche. In all these mines the prospects are very good. I think it is a highly mineralised district, from the fact that the farmers plough up great stones of tin, some of which may be seen at the Victoria Inn, Roche. I think it likely that, ere long, very numerous mines will be set at work in that district, which is almost a new one, very little having been done there in mining.

St. Stephens, by St. Austell, is another valuable district for tin. This district has not been much operated on. In St. Ewe, at the east, there was once a productive mine, called Hewas; and further eastward, in St. Mewan, a celebrated old and very productive mine—the well-known Polgooth. In St. Stephens several mines are now opening up well. Terras has numerous lodes of a very promising character. When the engine now being erected is set to work the company will be able to raise much tin. On the elvan there I put little reliance. East Terras contains many lodes, which only require a little development to make the property stand high in the market. Wheal Blencowe, on which an engine is also being erected, is sure to pay, because when last worked the returns were sufficient, at the present price of tin, to pay current cost; and there are several lodes, not then worked, which when worked on will, I suppose, make the concern a dividend one.

Then there are Fortescue Consols, Godolphin, Wheal Marshall, and Parkwyn, in the vicinity of the last-named mines, all likely to do well when spiritedly worked. If the smelters would be so kind as to keep the price of tin a little more steady I should feel obliged, as fluctuations are prejudicial to mining enterprise.

So far from mining in the county of Cornwall coming to its end, I believe we are as near its beginning as its close. Harmony and Montague, in Redruth, idle for nearly 40 years, have been resumed, and contain, as I learn from the agents, immense reserves of tin; it was formerly worked for copper only. R. SYMONS.

Truro, Sept. 14.

SCIENTIFIC MINING.

SIR,—Since the appearance of the first article headed as above it has been pretty generally criticised by mining men and in mining districts, and, after a test of three months' duration, I hear of no very serious objections to the law or rule laid down—that is, the point of junction the point of deposit, or probably, more correctly speaking, no junction, no deposit to be worthy of notice. I would advise those about to mine to seek a second or more elements, and not be induced, except under very peculiar circumstances, to start on a single one; and if tempted not to prosecute it to any great extent, as my experience of over forty years has been that it is a rare occurrence for it to be of any value, and when it has been it might be considered a malformation, or what is generally termed a deposit. To be able to find the productive points of our mineral lodes would be of vital importance to the county, as we are in a great measure dependent on our mineral wealth. Our shipping, by what is it supported?—by mining. Manufacturers and merchants, by what supported?—by mining. Our farmers, by whom supported?—by miners and mining. And without mining what are Cornwall's shipping, manufactures, merchants, or farmers worth?—literally nothing. Then, I would enquire what is the most important for our county's weal?—The answer is, the finding her mineral wealth. Machinery and machines have much to do, and it behoves us to perfect these in every possible way; but, first and foremost, I cannot but agree with Mrs. Glass, who advises us to first secure our hare before we attempt to dress or cook it.

I have presumed to designate this a new science; but is it a new science or not? If not, it is admitted that it is a science, and if a science, why, I would enquire, has it not been acted on? That it has been neglected we have ample proof—first, in the many mines that have ceased to work, having in them the elements to make productive and profitable mines. Those mines, after ceasing to be worked a few years, or probably a few months only, have again been opened up by a new party, and on this second or more attempt has been discovered the element which has enabled me to be so decided in my assertions as above. Further, is it not a known fact that almost all, "with but one or two exceptions," of our productive and rich mines have been condemned and their days of grace fixed, when the fortunate miner has accidentally hit on the required element? But, with ordinary care and observation, there should not have been anything accidental about its discovery. Assuredly not in depth; for it is too often the case that mines are sunk in depth, with little or no extension of levels. In some few cases, where there is a double or false shelf of rock, the lodes are with difficulty discovered, but when one or more is laid open a very shallow level on the course of the lode is generally sufficient to discover the droppers, cauntors, or cross-courses, and which I term the second element in the *natural galvanic battery;* and, as a rule, without one or the other, except, as stated above, a malformation, or, as miners term it, a deposit, we have no mines of any value.

Again, the many valuable mining setts in the county possessing the necessary elements not having been worked at recent date is another proof that the science has been neglected. There are many of our commons which have on them visible signs of the element required to make productive mining. The ancients have left their mark on almost the whole of our waste lands, and the individual that is disposed may read, at a very trifling cost, of the whereabouts of the junction without its putting in an accidental appearance.

With the view to exonerate many from an onerous responsibility, I will presume to term it a new science, and relieve them from the charge of blundering, which might be very fairly and justly brought home to them if permitted to remain as at first put, or as an established science; for we read in an old book, "He that knoweth to do and doeth it not shall be beaten with many stripes." But the question may be asked, is it possible to apply science to mining—*i.e.*, the finding the productive points of our mineral lodes, and to improve the present system of groping in the dark? Yes, decidedly; and any thoughtful man may be convinced of its feasibility by devoting a single day to the inspection of a highly mineralised district, and would readily perceive that there is an amount of light, if parties could be induced to recognise it, to enable them to deal very much more satisfactorily with the mineral kingdom than at present.

The light might have been made much more apparent had we a record office in the county, and connected with it a court of enquiry, so as to protect the capitalist. If such had been the case, the mine captains or promoters would long ere this have posted themselves up by a series of observations, statistics, &c., and which they could have readily done, and at a trifling expense, had there been facilities, as named above, to assist them. Such information would have vastly supported them in laying open our mineral wealth, and effecting a saving of hundreds, and, in many cases, thousands of pounds; for, with ordinary caution and perseverance, the points of junction, if any, may be readily ascertained at a very early date and with trifling cost, and enable them to decide if the adventure was worth prosecuting or not.

The navigator of the present day has his wind and current charts, &c. with the experience of a thousand navigators to guide him to his destined haven, the result of that beautiful system of physical research in which all the maritime

nations have agreed to unite for the furtherance and perfection of this mighty work. When shall we be enabled to say thus much in behalf of our mining operations? When that takes place we shall witness capitalists flocking again to our county to lay open our mineral wealth, and reap the rich harvest in store for them. But are we to wait patiently, and not put our shoulder to the work? Certainly not; our duty is to assist in every possible way the tide of events to flow more rapidly and successfully to our shores. Yes, most decidedly; and with the view to the more readily and satisfactorily carrying out of this new system, I would suggest that there be formed a scientific mining association, for proving and laying open mineral ground. By whom is this to be accomplished? By "One and All." But some will say that they have had sufficient of mining, and have retired from it disgusted. I do not doubt it for a moment, and whom have you to blame? Simply yourself alone; the same would occur again and again so long as you permitted yourself to be led blindly into any hole or corner by parties blind themselves and disposed to lead you. But what is your duty now, and your privilege? To assist towards a better state of things, and identify yourselves in every reasonable way to benefit your county—no less, in fact, than the taking the bull by the horns, and arrest, if possible, this wholesale system of misappropriation of property, and which is really the most lenient view of the case we can take. You do not retire from other business transactions, and why from this? You may be in a position to be able to do without it, but there are thousands who cannot; and with regard to the respectability or security of mining investments, let it be the study of "One and All" to make it as respectable and secure as any other branch of business. This can only be accomplished by co-operation; there is work at times to be performed that man of himself cannot achieve, and, again, work that may be executed and brought to a favourable issue by a single individual. I have undertaken such work, and have succeeded beyond my most sanguine expectations, as is well known in this county; and I may here state that I am equally sanguine with respect to this new science, and, if practical, would undertake to carry it out single-handed. I only require one trial, and by that I am prepared to stand or fall, so strong is my faith in the researches I have made and statistics in my possession. I would not have presumed so far was there a lingering doubt for the future of this new science; but, turn where I may, there is the same true metallic ring that one accustomed to the sound cannot be decieved. The notes given out by me a few years since on the wire-rope were not appreciated, because not understood To me they had the unmistakeable ring of the pure metal, and all who have been induced to adopt them have discovered at last the pure ring of gold connected with their use.

Capitalists and mine adventurers, you have now the wire-rope, and in return I ask to be assisted in this new system, feeling assured that, as has been stated, wire-rope has been the means of saving thousands of pounds per annum to the mining interest of Cornwall alone; so this system, if adopted and carried out, will effect a saving of tens of thousands per annum, and reduce the risk to capitalists beyond comparison.

The length of this letter is much beyond what I had intended, but I have consoled myself with the belief that the pages of your valuable Journal are always open to matter, irrespective of length, when for the benefit or furtherance of our mining interest. JAMES WILLIAMS.

Mining Directory Office, Hayle.

MINING IN CARDIGANSHIRE—MYNYDDGORDDU.

SIR,—In the interest of mining you, with many of your readers, will be pleased to hear that the long-pending dispute and suit in Chancery respecting this property has at last been settled. If not to the satisfaction of all concerned, it is to the end that this most valuable mining property may be forthwith developed. The prospects are such as cannot fail, upon being opened out, to put new life into mining in this district. This discovery, made about 15 months ago, only about 4 feet under the surface, has been equalled by nothing of the kind within the memory of the present generation—a lode of magnificent composition, having a leader of lead ore 4 ft. wide, worth at least 200*l.* per cubic fathom, generally is of such a masterly character as to be clearly traceable for 14 miles through the country, and has yielded at different points where it has been mined, more or less, from time immemorial, immense wealth. With your kind permission I will, in next week's Journal, refer again to this lode and its unparalleled history.

Aberystwith, Sept. 12. OBSERVER.

[For remainder of Original Correspondence see to-day's Journal.]

FOREIGN MINING AND METALLURGY.

There has been a slight revival during the last few days in the French coal trade. In presence of the continued scarcity of railway rolling-stock industrials appear to have decided to accept freights whatever they may be. A fall in freights cannot be anticipated for the present, the demand for boats being both numerous and pressing. As regards the means of remedying the scarcity of plant there is the same indecision on the part of industrials, and the same sluggishness on the part of the railway companies. Delegates of the Chambers of Commerce of the northern district—Dunkerque, Lille, St. Quentin, Boulogne, Amiens, and Calais—have been received by the Ministers of Commerce and Public Works. The ministers promised that the Northern of France Railway Company should endeavour to meet the complaints made. In Belgium the coal committees of Charleroi, Mons, Liége, the Centre, and Namur have also been received by the Belgian Minister of Public Works. It is greatly feared, however, that interviews of this kind will be attended with no practical results. The companies do not wish to make sacrifices for the accommodation of business which they regard as comparatively unremunerative. In France the railway managers entrench themselves behind the disasters of last year, and the apparent disorganisation of their services; in Belgium they shelter themselves behind the Government, and all complaints, whatever form they may assume, seem likely to be fruitless. It would seem to be the true policy of industrials to help themselves by supplying wagons of their own. Prices of coal have remained without variation.

Two German establishments have recently concluded important contracts with the Brest and Grajewo (Russia) Railway Company. The contracts relate to 44 locomotives, 22 passenger carriages, six baggage vans, and 730 goods trucks. These important orders have been shared between the Eggerstorff Company (Hanover), and the Elbing Railway Plant Construction Company.

The advices received as to the Belgian iron trade are favourable. Pig is disposed of regularly, and a good current of orders prevails for merchants' and construction iron. The demand for plates is so considerable that the rolling-mills can hardly keep pace with it. Casting pig, No. 5, has made 3*l.* 14s.; ditto, No. 4, 3*l.* 16s.; ditto, No. 3, 3*l.* 18s.; ditto, No. 2, 4*l.*; ditto, No. 1, 4*l.* 2s. per ton. Iron in bars has made 6*l.* 16s. per ton, and rails 7*l.* per ton. Unfortunately strikes are spoken of on all sides in Belgium; the working mechanics of various firms are demanding a reduction of their hours of labour to ten hours per day, overtime to be paid for at double rate. The masters appear disposed to concede the ten hours system without any reduction in wages, but object to paying for overtime at an extra rate. The tendency to strikes appears, however, to be becoming more and more general.

The dividend of the Luxembourg Mines and Sarrebruck Forges Company for 1870 has been fixed at 12½ per cent. Several metallurgical establishments of Lorraine are stated to have largely availed themselves of the privilege to import iron temporarily duty free. The works must make *bona fide* importations to enjoy the promised exemption from duties. The Vieille Montagne Company is about to suppress its establishment at Eppinghofen. Difficulties with workmen are alleged as the cause of this step, but the real cause is, it is stated, to be found in the political events of 1870 and 1871. It is said to be also the intention of the company to suppress its works at Borbeck and Oberhausen, and to transfer them into France. The suppression of the Eppinghofen establishment appears likely to be a great loss for the Ruhr district.

Copper has been generally quiet upon the continental markets. At Havre, Chilian in bars has made 69*l.* to 70*l.*; refined ditto, in ingots, 77*l.* to 80*l.*; Peruvian minerals (pure standard), 70*l.* to 72*l.*; United States (Baltimore), 76*l.* to 78*l.*; ditto Lake Superior, 80*l.* to 86*l.*; Mexican and Plata in bars, 66*l.* to 68*l.*; old yellow copper, 40*l.* to 44*l.*; red ditto, 62*l.* to 66*l.*; and bronze, 62*l.* to 66*l.* per ton. The tin markets have been irregular, but the tendency has not been upwards. At Rotterdam and Amsterdam, Banca has made 79½ fls., and Billiton 78 fls. Banca to be delivered at the autumn sale of the Society of Commerce can be obtained at 78½ fls. There has been very little doing in zinc. At Paris, Silesian to be delivered at Havre has made 19*l.* 12s. per ton; and other good marks to be delivered at Havre, 19*l.* 4s. per ton.

First and second-class iron is selling in the department of the Nord at 8*l.* 4s. to 8*l.* 8s. per ton, free at Paris. There are, however, great complaints in the Nord as to insufficient means of transport. Iron from coke-made pig has a very restricted sale, the Alsace outlet being closed, and Paris consuming but little. Iron from coke-made pig is quoted at 9*l.* to 9*l.* 4s. per ton; ditto, from charcoal-made pig, 10*l.* 8s. to 10s. 16s. per ton; machine iron from charcoal-made pig, 11*l.* 12s. to 12*l.*; ditto from mixed pig, 10*l.* 8s. to 10*l.* 16s.; ditto coke-made, 9*l.* 12s. to 10*l.* per ton. The Champagne Committee of Forgemasters has come to the conclusion that it will be desirable to send a special delegate to the Minister of Public Works or Finance to represent the present state of the Customs duties question in the districts annexed to Germany. It is contended that a preferential tariff granted to Alsacian industrials, while Germany no longer admits into Alsace and Lorraine French goods unless they pay Customs duties, will be prejudicial to all France, and especially to industrials in the East of France. It will also, the committee argues, bear heavily upon the departments nearest to the frontier—departments which suffered the most from the invasion, and which are destined to be the last occupied.

FOREIGN MINES.

DON PEDRO NORTH DEL REY (Gold).—Telegram from Lisbon: Produce for July, 15,717 oltz.; weighed to August 17, 5980 oltz.—Comparison: July, 1871, 15,717 oltz.; first division of next month, 5980 oltz.; June, 1871, 14,414 oltz.; first division of next month, 5618 oltz.: July, 1870, 6861 oltz.; first division of next month, 3344 oltz.

EBERHARDT AND AURORA.—Telegram from Mr. Thos. Phillpotts: Profits for August, $65,000—13,000*l.*

FERGUSSON (Gold).—Telegram from Superintendent: Fergusson yield. $6300; profits. $3000. Bath (mines) opening well.

JAVALI.—The directors have advices from their managing director, dated Aug. 4. Everything was in good working order, and in future the remittances will be made every two months instead of monthly. Twenty stamps are at work, and about 40 ozs. of gold ready towards the next remittance. The heavy rains prevented the free transmission of ore to the mill, but in the meantime there is plenty of paying common ore, which can be transported cheaply.

PACIFIC.—Capt. Prideaux, Lander Hill, Aug. 22: The ledge in the rise at the 550 ft. level is 1 ft. thick, and very rich, the ore (not the richest) assayed $525 per ton of 2000 lbs. The ledge in the cross-cut is from 1 ft. to 1½ ft. thick; some of the second-class ore from this ledge assayed $113 per ton of 2000 lbs. I think that the first-class is worth not less than $400 per ton. The stopes are also very rich. We have commenced to work a new stope at the 400 ft. level; the ledge is 2½ ft. thick, and worth $200 per ton. I shall prepare to take out this ore on a large scale. We are sampling our ore. I will write again as soon as we have finished sampling. After sampling I shall have on hand for the Pacific Company's mill not less than 50 tons of ore.

CHONTALES (Nicaraguan).—Mr. Bell, August 5: In opening out upon the lode at San Benito East we have cut some of the richest ore that has ever been seen at these mines. The discovery is near the top of the lode, and, no doubt, is exceedingly rich; and it has further to be said in its favour that it has not been interfered with by the natives. In the last 6 feet driving the lode for 7 feet in width (which is the width of the level) has been worth 3 ozs. per ton, and yesterday Capt. Evans reported the end to be worth 5 ozs. to the ton. How far it will continue no one can guess. But independent of the rich leader (which in some parts will yield 100 ozs. of gold to the ton), we have a large and profitable lode, which for ¾ mile is almost unexplored. I consider this mine promises to turn out a great prize. At present very little of this rich ore has been taken to the stamps, and our returns for this month have been further diminished by a run of ground having occurred in San Antonio Mine, which cut us off from our ore and gave a short supply to the stamps. At the same time we had to take up and relay a considerable portion of the San Benito west tramway, but I am happy to say that the San Antonio Mine has considerably improved, and is again in working order. The twelve new revolving stamps are erected, and work admirably. I am glad that you are sending out 24 more heads, together with an engine-wright, to erect them and the second steam-engine. We have also had very severe weather, which has greatly impeded our general works; but, notwithstanding these hindrances we have sent to the stamps 416 tons of ore, which yielded 217 ozs. of gold, value $3005, or 601*l.* The working and general cost for the month has been $3447, or 689*l.*, showing a loss of 88*l.*, to which must be added expenditure on new tramway at San Benito East, $917, or 183*l.* Taking into consideration the serious drawbacks referred to, and the great discovery of rich ore made at San Benito East, the month's operations must be considered satisfactory. The medical officer reports the health of the establishment to be good.

Aug. 5.—San Antonio Mine: The stope in the back of the Connection level has been stoped 40 varas; lode 3 ft. wide, worth 10 dwts. of gold per ton. The stope in the back of No. 5 level has been stoped 70¾ varas; lode 2 ft. wide, worth 1 oz. of gold per ton. The level driving west of Pita's, or eastern cross-cut, on the course of the lode, has been driven 33¼ varas, on a lode 4 ft. wide, worth 3 dwts. of gold per ton. A rise in the back of the same level has been risen 18 varas, on a lode 3 ft. wide, and is worth 6 dwts. of gold per ton. The deep cross-cut has been driven 5¼ varas; the ground is somewhat easier for driving. In consequence of heavy rains the stope in the back of No. 6 level run together, and prevented communication with the Connection level for a fortnight, which accounts for the small quantity of ore extracted.—West San Benito Mine: The stope in the back of No. 1 level has been stoped 11 varas on the south part of the lode, which is about 4 ft. wide, yielding 4 dwts. of gold per ton.—East San Benito Mine: Very little work has been done in the mine during the past month, as the men have been working on the tramway, which is now completed, and works to our entire satisfaction. We have commenced to drive Nos. 1 and 2 levels. In the former there is a very rich nail; in fact, the richest we have seen in any part of the mines; for 14 feet it was worth about 5 ozs. per ton for the whole width and height of the level, 7 ft. by 8 ft.; the shoot of ore ground now appears to be dipping east. The No. 2 level is worth 6 dwts. of gold per ton. The number of tons sent to the stamps is as follows:—From San Antonio, 300 tons, yielding 11⅔ dwts. per ton; from West San Benito, 92 tons, yielding 4 dwts. per ton; from East San Benito, 24 tons, yielding 1 oz. per ton: in all, 416 tons, yielding 217·300 ozs. melted gold.—J. TONKIN, W. EVANS.

YUBA (Gold).—A letter has been received from Mr. Mattingly, dated Atlanta, Idaho, Aug. 15, which states that he has been busily engaged in making all necessary arrangements and preparations for the commencement of work in the mine—or rather in the two mines—and for starting the mill into operation. The mill would be started in a few days to crush rock from the Leonora, of which there are now 30 or 40 tons at the mill. So soon as this is done the carpenters will proceed as rapidly as may be to put up the pans, settlers, and other machinery necessary for working the ore from the Stanley Mine, which, he is pleased to say, looks well indeed. Owing to the high prices, or rate of wages, that has been heretofore paid to miners in this camp (from $6 to $7 per day), and of his determination not to pay such exorbitant wages, he met with for the present some trouble in getting men or miners to work at his rates, which he has placed at from $3½ to $4 per day for good hands. He is satisfied he will get all he wants at these rates, and when properly organised for work will get them for less. As the work heretofore done in the Stanley has been more for the purpose of prospecting and ascertaining where the rich or pay ore is than for extracting it from the mine, much work will now have to be done in straightening out the tunnel, and running a main drift in the proper place and direction on the lode, and for laying car tracks, before he can take much ore from the mine. The ore where the prospect drift or cut has reached the lode is rich, showing both native and ruby silver, and indications of large bodies of it. At this point the ledge had not been cut through, and he could not say what its extent or width will be, but certainly large. He will be able to get out ore long before our mill will or can be in a condition to work it, but he hoped to get the use of another mill near by, and which is suitable to work it for a few months, or until theirs will be ready. The prospect for an early success—and a brilliant one—for the future of the company is most flattering.

SATURN (Silver).—The directors have received a long and favourable report from Mr. Fowler, who was sent to examine and report on the mine.

NORTH AMERICAN (Gold).—The directors having now secured the promise of a further extension of time for purchasing the mines, which at the date of their circular of Aug. 17 had not been arranged, a general meeting of the shareholders will be held on the 20th inst.

NEW ZEALAND (Quartz Crushing and Gold Mining).—J. Thomas, Coromandel Gold Fields, July 12: The long-looked-for completion of the Government tramway for conveying the quartz from all parts of the field will be opened for public traffic at the end of this month, when I anticipate quantities of rich quartz will shortly be coming in abundance to be reduced. In the meantime I am completing a small branch tramway of 228 ft. long, of the same gauge as the Government line, to bring their loaded trucks direct to our stampers, which I hope to have completed in eight or ten days. I hope to have the pleasure of sending you a much more cheering report in a very short time. During the past month one of our mines crushed at their battery 320 tons of quartz, yielding over 6½ ozs. of gold per ton, which shows the rich nature of this gold field.

N.B.—The following extract has also reached a member of the board from Capt. Thomas:—"I hope very shortly as the spring season comes on, with fine weather, that we shall get as much work as we can do. We are now prepared for it rightly. The Tokatea claim crushed this last month 320 tons of quartz, yielding over 6½ ozs. of gold to the ton. That will show what is in the ranges if they were only developed in depth. The Puketutu reef is a part of the same run as the Tokatea vein, and I like its appearance better than the Tokatea reef." It may be observed that the Puketutu quartz reef has been acquired by the company on lease.

ANGLO-ARGENTINE.—Capt. Joseph Vivian reports for June:—"I am glad to report the safe arrival of the first troop of carts, with about two-thirds of the amalgamating machinery; all in good condition. In Manager Mine the stopes in back of deep adit level are looking remarkably well, lode of same size and character; with sufficient force, I believe the stamps could be supplied with ore from this place alone. In North Mine, Colonel, the old workings are now clear of *debris* and stoping has been commenced. The lode is large, and presents a splendid appearance. There is undoubtedly a great and good mine here."

CAPE (Copper).—The directors have despatches per Cambrian. The reports of Spectakel, Koperberg, and Springbok are received, and show no material alteration from last.—Railway: The locomotive was working satisfactorily. Transport from July 1 to 29, 750 tons. The accounts of smelting to June 30 have arrived, and are under examination. The Antonio Vinent arrived at Port Nolloth on July 25, and would load 620 tons of ore. The Croydon sailed from Buenos Ayres for Hondeklip on July 27, and would probably arrive about the end of August. The ore and regulus on beach waiting shipment amounted to 2500 tons.

Spectakel, July 15.—The incline has been sunk 1 fm. 3 ft. 6 in. during the past month, through ground that will yield 1 ton of copper ore per fm. This place is now worked by three men and six labourers on day wages. The incline is improving every sink that is made, and I hope by the next report day that I may be able to state the yield at 3 or 4 tons, instead of 1 ton. The stope in the back of the 27, east of Thomas's shaft, will yield 1½ ton of copper ore per fm. Ground stoped during the past month 9 fms. (202 ft.) This place is suspended for a short time. The stope in the back of the 27, north of incline, will yield 3 tons of copper ore per fathom; ground stoped during the past month, 21 fms. (132 ft.) Re-set June 29, to two men and nine labourers, 20 fms., or the month, at 3*l.* 5s. per fathom. The 27, east of the flookan course, has been extended during the past month 4 ft. 9 in.; this end is poor at present. Re-set June 29, to one man and one labourer, 1 fm., or the month, at 18*l.* per fathom. The stope east of Rowsby's pitch, in the 36, will yield 2 tons of copper ore per fathom; ground stoped during the past month 3 fms. (72 ft.) This place is now suspended for the present. The stope in the 36, north-east of Arond's pitch, will yield 2½ tons of copper ore per fathom; ground stoped during the past month 10 fms. (160 ft.) This place is also worked on day wages by one man and six labourers. The stope in the bottom of Rowsby's pitch, north from incline, will yield 2½ tons of copper ore per fathom; ground stoped during the past month 9 fms. (200 ft.) Reset June 29, to one man and four labourers, 6 fms., or the month, at 3*l.* 10s. per fathom.—THOS. J. RODDA.

Ookiep, July 24.—Koperberg: The adit level, east of Carson's shaft, has been extended during the past month 2 fms. 5 ft. through very kindly ground, which has produced some rich stones of copper ore, but not in quantity sufficient in value; the end at present is of much the same appearance. We have put the men from the end with the shaftmen, as the water has very much increased in the shaft, to drive the 10 west from Carson's shaft, below the adit, under the run of ore driven through in the adit, where we hope to find the lode improved in size and quality. The shaft during the past month has been sunk 1 fathom through ground thickly impregnated with copper ore; the part of the lode we are now carrying is about 5 ft. wide, but how much wider it is we cannot say as we have not cut through it. We have not as yet set the 10, as we are in doubt if we shall be able to keep the water with barrels; it may not be anything more than a case of water, if so when once drained we shall then be able to go on again very comfortably.—Springbok: The winze sinking below the 10, west of Nixon's shaft, has been sunk in the past month 4 ft. 5 in., in ground that has produced about 1 ton of rich copper ore per fathom; at present it is very poor, but looking kindly. We put the men in the early part of the month to drive and stope west from the winze in the run of ore, which will yield about 3 tons of rich copper ore per fathom. Ground stoped in the past month 2 fms. 2 ft. Re-set, July, to four men and six labourers, at 8*l.* per fathom, for 6 fathoms, or the month. We estimate the copper ore raised during the past month to be about 6 tons.—JOHN WILLIAMS.

PESTARENA UNITED.—T. Roberts, J. Mitchell, J. Roberts, T. Warne, Piedmulera, Sept. 2: Ore treated in the three districts in August, 756 metrical tons; gold produced, 466 ozs. 12 dwts. 13 grs.; average yield per ton, 12 dwts. 7 grs. Our produce per ton would have been higher only for our being one part of the month engaged at Val Toppa Mine in supplying Hodgson's Wire Rope, now on its trial, with an inferior ore and part of it we have had to amalgamate. With our present staff of miners we find not the least difficulty in supplying the rope with 50 tons of ore per day, but while the trial of the rope is going on it must be borne in mind that the quality of the ore will be under the average of that of former months.—Mines, Val Toppa: We are working on the great quartz lode two stopes in the back of No. 2 level, and one stope in the bottom, where the lode is producing 30 tons per fm. for the width of the lode, and the stopes in back of No. 3 level, on this lode, yield 16 tons per fm., and a second stope in the back 10 tons per fm.; we estimate the ore coming from the above-mentioned stopes to be worth 7 dwts. per ton. The intermediate end, driving on the quartz lode above No. 3 level, yields 10 tons per fm., worth 15 dwts. per ton. On the western part of the great quartz lode we are driving in Zero level both north and south of cross-cut; the end north yields 3 tons of ore per fm., worth 10 dwts. per ton. The end south in No. 1 level, on this lode, yields 4 tons per fathom, at 12 dwts. per ton. A winze sinking in this level, 8 tons per fm., at 12 dwts.; and a winze in No. 2 level, on this lode, produces 8 tons per fm., at 10 dwts. per ton. The stope in the south end of the ground, on this lode, yields 10 tons, at 10 dwts. No. 1 stope in back of No. 2 level, on the flat lode, has fallen off, yielding at present 7 tons per fm., at 10 dwts. per ton. No. 2 stopes, on this lode, yield 12 tons per fm., worth 17 dwts. per ton. The winze on this lode, under No. 2 level, yields 8 tons, at 12 dwts. per ton. The intermediate end between Nos. 2 and 3 yields 8 tons per fm., worth 1 oz. per ton. No. 2 stopes, in back of No. 2 level, on the new lode, yield 8 tons per fm., worth 12 dwts. per ton; and No. 3 stopes, south of No. 1 cross-cut, 7 tons per fm., worth 12 dwts. The two stopes in bottom of No. 2 level, on this lode, north and south of winze, yield 12 tons per fm., worth 10 dwts. per ton. In No. 3 level we have resumed driving No. 1 cross-cut west to cut through the lode. The end driving south from the second cross-cut west is hard and poor. The winze sinking in this level yields 7 tons of ore per fm., worth 7 dwts. per ton. Nothing new in the other points not mentioned.—Pestarena, Acquavite Mine: We are yet engaged in putting down in the whim-shaft the skip-road from the 23 to the 33. No change in the cross-cut west in the 23. The end driving south in this level has improved, yielding of late saving work.—Pescheira Mine: Good progress is being made in clearing the old 55 end north. The end driving south, pointing towards the Pozzone Mine, is yielding stones of ore, and bids fair for an improvement. The stopes in back of the 46, on No. 2 lode, yield 5 tons per fm., worth 14 dwts. per ton. The 33 end, driving north on No. 5 lode, yields 2½ tons per fathom, worth 15 dwts. per ton; and the end north in this level, on No. 2 lode, yields 2 tons per fathom, worth 12 dwts. per ton. The north stopes in the back behind this end yield 4 tons per fm., worth 1 oz. per ton; and the south stopes in the back 6 tons per fathom, worth 15 dwts. per ton.—Boundary: The stope in bottom of the 10 yields 7 tons per fm., worth 14 dwts. per ton.—Surface: At Battigio establishment we are now engaged in taking down and sending on to Pestarena parts of work for 12 large mills. We have completed bids for two large mills at Pestarena, and the stonecutters are now engaged in making some new beds.

WEST CANADA.—Aug. 25: Wellington: At Rowe's shaft the pitwork is put down, and the men are now putting in timber, &c., to protect the lift when blasting. The stope east of Rowe's shaft is looking just as usual, and will yield about 2¾ tons of ore per fm. The stope west of this shaft is finished, and two of the men are cutting hitches in the shaft.—Huron Copper Bay: In the 60, east of Bray's shaft, the lode is large, and the south wall is not seen; it yields 2¼ tons per fm. In the 50, west of Palmer's, the lode is small and unproductive; we shall drive out north in search of the main part of the lode. In the 35, west of Bray's, on Fire lode, a communication by borer-hole has been made with the workings on main lode; this end is worth 2 tons per fm. The stope under the 50, west of Palmer's, will yield 2 tons per fm. In the back of the 50, east of same, the men have been stripping down ground on the north side of the stope, and taking down the north branch, which is looking well, and from which we expect good returns next month. The stope below the 50, east of Bray's shaft, will yield 2 tons per fm. In the back of the 35, west of Palmer's, the stope yields 3 tons per fm. Two stopes in bottom of the 35, east of Bray's shaft, yield 2¾ and 3 tons respectively.

PONTGIBAUD.—W. H. Rickard, Sept. 1: Monthly Report: Roun Mine: The 60 metre level, north of cross-cut, on Virginie's lode, yields ¾ ton of ore per fathom; the rise in the same level south yields ½ ton. The 20 metre level south is unproductive; the men are set to rise for ventilation a little behind the end, in a lode worth ½ ton of ore per fm.; the same level north yields a little saving work. The adit south yields ¼ ton per fm. The adit south of the mill cross-cut is unproductive. The rise in the back of this level yields ¾ ton per fm. The cross-cut east towards No. 3 lode proceeds very satisfactorily. The stollen south on the lode is suspended, and the men put to cross-cut west to intersect the tin lode. Our tribute pitches maintain their usual yield.—La Grange: The 100 metre level, north of Nosky's shaft, yields ¼ ton of ore per fm. The winze below the 80 yields ½ ton. The tribute pitches produce about their usual quantity of orestuff.—Mioche: The 20 metre level, north of winze, opens orey ground, worth about ½ ton per fm.—La Brousse: The 120 metre level north is unproductive; the same level south yields ¾ ton of ore per fm. The 100, in the same direction, yields ¼ ton; and the 80 south ¾ ton per fm. The 60 south yields a little saving work. Our tribute pitches continue their usual yield.—Pranal: The 70 metre level north yields ½ ton per fm.; the same level south 1 ton; and the 70, on the western part, ½ ton per fm. The 50 north is unproductive; the same level south yields a little low quality saving work. The 50, under St. George's shaft, is in stiff ground. The tribute pitches throughout the mine yield a little less ore than last month. Our workpeople have returned to their several duties, and all the machinery throughout the mines works satisfactorily. The weather is now very dry, which if it continues will affect our washing operations. Our samplings have amounted to 270 tons.—St. Amand: The 25 metre cross-cut, at Susan's shaft, has intersected the lode, which is 1 m. 80 c. wide, of a very regular appearance, containing occasional stones of orey stuff. The greatest part of the old workings in the adit is yet north of the point. We have set to drive north and south of the cross cut with all speed.—La Brugere: The La Planche adit level continues in a strong lode, chiefly composed of quartz, occasionally spotted with silver-lead ore. The Moulin adit level yields a little saving work from a vein 4 in. wide, of kindly appearance.

[For remainder of Foreign Mines see to-day's Journal.]

ECLIPSE (Gold).—The new mill of the Eclipse Company is all complete and ready for operating with 30 stamps, except that the new turbine-wheel designed to furnish the motive power has not arrived. Capt. Tregelias visited San Francisco expressly with the view of hurrying the wheel through in time, but owing to some negligence, probably the teamsters, it is now several weeks overdue, and nothing can be done till it arrives. The new wheel is said to be very perfect in every respect. The people of this valley have the success of the company almost as much at heart as the stockholders themselves, and we have every reason for anticipating most gratifying results under the present programme.—*Ingo Independent* (California).

MINING IN JAPAN.—While the arsenal at Yokoska and the mint at Osaka have been opened with the due amount of ostentation and publicity the Japanese Government have recently had completed for them a more humble but nevertheless quite as important, an undertaking as either, without its being even heard of. Mr. Gower, mining engineer to the Government, has erected a set of machinery on the island of Sado for crushing and washing the gold quartz, which is found in such abundance there, and it now has been at work for the last few weeks. Sado has been the scene of mining operations for a period unknown period, mines being found in different parts of the island, of which no record exists as to when they were worked. Those at present in operation lie on the west side of the island, at a village called Ai-kawa, and here Mr. Gower has erected his machinery. The entrances to the mines are in a valley running up from the village, and they are generally from 150 to 200 ft. above the level of the sea, and from one to one and a half mile from it. The present machinery has been erected at the foot of this valley, and from the mines a 3-ft. gauge tramway has been partially constructed, which, when completed, will be an immense saving of labour in the conveyance of the quartz. About three quarters of a mile of the tramway is already finished, and it is calculated that a saving over the whole system of one-fifth the cost of transport has been effected by it. In this valley alone there are hundreds of mines which have been worked at different periods within the last 200 years, 29 of which are at present in operation. Four thousand mirers, crushers, &c., are employed at these, who, with 3000 fishermen and agricultural labourers, compose the population of the village. The natives, who have been in the habit of crushing the quartz with heavy iron mallets worked by hand, while the grinding and washing processes were equally primitive, have succeeded in working 6 to 8 tons of quartz per day, at a great expense to the Government. The new machinery is capable of doing out 18 to 24 tons per day, its working expenses not being more than $2 to that time. The quartz is said to be very rich, having large quantities of silver, and copper in it, but extremely hard, and therefore difficult to work. The machinery is erected in a substantial wooden building, and is driven by an engine of about 20-horse power. The whole process of breaking up the quartz, converting it into powder, washing the powder so formed, and separating the gold, silver, and copper, is here carried on. And as parts of the machinery are most unwieldy and heavy, too much credit cannot be given to Mr. Gower, who with the assistance of a single European, has managed to put them all in their places, and to all appearance in perfect working order.—*Japan Mail.*

Coal has been discovered in Rajpore and Kummun, in the territories of the Nizam. Miners have been sent to ascertain the extent of the seam.

Advices from Auckland state that the Caledonian Gold Mining Company, with a capital of 34,320*l.*, in 2860 shares of 12*l.* each, has distributed amongst its shareholders in the space of five months 141*l.* per share, or a total of 413,260*l.*, from about 145,000 ozs. of gold raised.

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